

METHOD OF IMPROVING X-RAY LITHOGRAPHY  
IN THE SUB 100nm RANGE TO CREATE  
HIGH QUALITY SEMICONDUCTOR DEVICES

Abstract of the Disclosure

The present invention is directed to the production of high quality semi-conductor devices created at speeds and in sizes that far exceed current x-ray lithography capabilities. The steps involved in the method include the use and development of horizontal beams from a synchrotron or point source of x-ray beams; preparation of submicrometer, transverse horizontal and vertical stepper stages and frames; providing a stepper base frame for the proper housing and mating of the x-ray beam; minimizing the effects of temperature and airflow control by means of an environmental chamber; transporting, handling and prealigning wafers and other similar items for tight process control; improving the control and sensing of positional accuracy through the use of differential variable reluctance transducers; controlling the continuous gap and all six degrees of freedom of the wafer being treated with a multiple variable stage control; incorporating alignment systems using unambiguous targets to provide data to align one level to the next level; beam transport, shaping or shaping devices, to include x-ray point sources; using an inline collimator or concentrator for collimating or concentrating the x-ray beams; and, imaging the mask pattern at the precise moment for optimum effectiveness.

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